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Notes on Cyperaceæ.

BY WILLIAM BOOTT.

SCIRPUS (BLYSMUS) RUFUS, Schrad. Culmo filiformo lævi, 3–15 poll. longo. Foliis 2–4 angustissimis canaliculatis culmo brevioribus. Spica simplici, oblonga, 6 spiculis 3–8 contiguis, sessilibus, apice culmi spicatis, nuda vel bractea foliosa culmum sæpe superante suffulta. Spiculis distichis lanceolatis, 2–5 floris, 3 lin. longis. Squamis castaneis membranaceis ovatis paucinervatis. Achenium ellipticum, biconvexum, acuminatum, stylo longo continuo bipartito apicatum, basi acutum. Stamina 3. Setis sæpius nullis.

Salt marshes, Manitoba, July 20, 1881. Common on the seashore, Gaspé, Dom. of Canada, Aug. 9, 1882. Macoun. Also native of the north of Europe.

Stem filiform, smooth, 3–15 inches long. Leaves 2–4, very narrow, channeled, shorter than the stem. Spike oblong, simple, of from 3–8 contiguous sessile spikelets at the summit of the stem, naked or subtended by a narrow leaf-like bract that often exceeds the stem. Spikelets 2 ranked, lanceolate, 3 lin. long, 2–5 flowered. Scales chestnut, membranous, ovate, few-nerved. Nut elliptical, biconvex, acuminate, tipped by the long continuous bipartite style, acute at base. Bristles commonly none. Stamens 3.

RHYNCOSPORA HARVEYI, sp. n. Glauca. Culmo 1½–2 ped. alto, gracili, triangulo, lævi, basi plurifoliato. Foliis 1 lin. latis, 6–10 poll. longis, apice scabro attenuatis; culmeis 2, supremum medio culmo ortum. Vaginis 1 poll. longis. Bracteis herbaceis, angustis corymbis longioribus. Corymbis 2–3, remotis, suprema majore composita, brevi 2–3 ramoso (ramis ½ poll. longis vel brevioribus), reliquis subsimplicibus pedunculatis. Pedun-

culis 1–1½ poll. longis. Spiculis orbiculari-ovatis, acutis, ramulosum apice 3–6 aggregatis, bracteolis angustis brevioribus. Flos unica fertilis. Squamis castaneis margine angustissimo albidis; interioribus 2 parvis oblongis obtusis emarginatis vel acutis mucronatis; reliquis magnis, concavis, mediis rotundo obovatis obtusis marginatis e sinu mucronatis (mucrone albo recurvato); superioribus ovatis acutis vel mucronulatis achenia paulo superantibus. Achenium castaneum, obovatum biconvexum, circa 1 lin. longum, transverse recte rugulosum, tubercul[illegible]depresso conico basi ovali soluto ⅔ longius. Setis 6 antror[illegible]um denticulatis achenis 3-4 plo. brevioribus.

Grand Prairie, E. Arkansas, *F. L. Harvey*, 1883.

Glaucous. Stem 1½–2 feet high, slender, triangular, smooth, several leaved at base. Leaves 1 line broad, 6–10 inches long, tapering to a rough point; stem leaves two, the upper at the middle of the stem. Sheaths 1 inch long. Bracts green, narrow, longer than the corymbs. Corymbs 2–3, remote; the uppermost the largest, compound, 2–3 short branched, branches ½ inch long or less; the others nearly simple, peduncled. Peduncles 1–1½ in. long. Spikelets orbicular-ovate, acute, aggregated 3–6 together at the top of the branchlets, shorter than their narrow bractlets. Only one fertile flower. Scales chestnut, with a very narrow white border; the lower two small, oblong, obtuse, emarginate or acute; the others large, concave, the middle ones round, obovate, obtuse, emarginate, a white recurved mucro inserted in the sinus; the upper ovate, acute or short mucronate, a little longer than the nut. Nut chestnut, obovate, biconvex, about 1 line long, finely transversely wrinkled in straight lines, ⅔ longer than the depressed-conical, oval, free based tubercle. Bristles 6, upwardly toothed, ⅓–¼ the length of the nut.

Very like *R. cymosa*, Nutt. It differs from that species in its narrower leaves, its monocarpous spikelets, its larger, more tumid nut, and its finer, not wavy wrinkles.

CAREX STRAMINEA, Schk., var. INVISA, var. n. Cæspitosa multiculmis. Culmis gracilibus, angulis acutis scabris, infra medium foliatis. Foliis longe vaginatis, lineam latis, sursum attenuato-filiformibus, culmis longioribus vel brevioribus. Bracteis e basi lanceolata margine albida filiformibus, 1-6 poll. longis, inferioribus 1-2 culmum proximis spiculas suas superantibus. Spica solitaria oblonga vel subobovoidea erecta, cernua vel apice pendula, 3–5 poll. longa, e spiculis 3–12 congestis, contiguis vel alternatis subdistantibus; vel spicis 1–3, inferioribus remotis pedunculatis apice spiculas 1–4 gerentibus. Pedunculis 1–12 poll. longis læviusculis. Spiculis

ellipticis, basi acutis, apice apertis, 4–6 lin. longis. Squamis membranaceis, argenteis, demum pallide castaneis, lanceolatis, acutis, breve scabro-aristatis, perigyniis angustioribus, inferioribus iis longioribus superioribus brevioribus. Perigyniis pallide viridibus, $2\frac{1}{2}$–3 lin. longis, $\frac{1}{2}$ lin. latis, ovalibus vel subobovatis alatis acuminato-rostratis, rostro bidenticulato margine serrato dentato, dorso fisso, tenui nervatis, lateribus corrugatis. Achenium castaneum, oblongum, lenticulare, stipitatum perigynio laxe inclusum, eo duplo brevius et angustius.

Common on margins of ponds and in ditches in sandy soil, E. Massachusetts. Mt. Desert, Maine.

Well distinguished by its long, thread-like bracts.

Tufted, bearing many stems. Stems slender, the sharp angles rough, leaved below the middle. Leaves long-sheathed, a line broad, tapering to a thread-like summit, longer or shorter than the stem. Bracts thread-like from a white margined lanceolate base, 1–6 in. long; the lower longer than the stem; the next above than their spikelets. Spike solitary, oblong or subobovoid, erect, nodding or pendulous at the top, 3–5 in. long, composed of 3–12 congested contiguous or alternate subdistant spikelets; or spikes 1–3, the lower remote, peduncled, bearing at the top 1–4 spikelets. Peduncles 1–12 in. long, smoothish. Spikelets elliptical, acute at base, open above, 4–6 lin. long. Scales membranous, silvery, becoming pale chestnut, lanceolate, acute, roughly short-awned, narrower and the lower longer and the upper shorter than the perigynia. Perigynia pale green, $2\frac{1}{2}$–3 lin. long, $\frac{1}{2}$ lin. broad, oval, or subobovate, winged, acuminate, beaked, the beak bidenticulate, serrate-toothed on the margin, fissured on the back, delicately nerved, the sides wrinkled.

CAREX PRÆGRACILIS, sp. n. Culmis (ima parte et foliis culmeis deficientibus) 26 poll. longis, strictis tenuissimis, lateribus vix $\frac{1}{2}$ lineam latis, angulis acutis spurascabris. Foliis sterilibus attenuato filiformibus, convolutis, sectione transversa perfecte circulari. Spica ferruginea oblongo-lineari, $\frac{1}{2}$ poll. longa, e spiculis 3–4 contiguis sessilibus, suprema majore claviformi basi mascula, cæteris femineis ellipticis paucifloris. Bracteis e basi ovata, margine hyalina complectente, attenuato aristatis, aristis scabris, subexcurvis spiculis longioribus, culmo plerumque brevioribus. Squamis bracteis conformibus, marginibus latioribus, aristis brevioribus, perigynia tegentibus. Perigyniis cartilagineis ferrugineis, basi pallidis, glabris, ovatis, acuminato-rostratis substipitatis $1\frac{1}{2}$ lin. longis, $\frac{3}{4}$ lin. latis, rostro antice alte fisso, fissuræ marginibus albidis, facie exteriore convexis, faciei interioris marginibus incurvis, supra serra-

tis; obscure nervatis. Achenium castaneum rotundo-ovatum biconvexum perigynium implens. Stigmata duo, stylus inclusus.

San Diego, California, *Miss Scott*, 1880.

Stem (the lower part and stem leaves wanting) 26 in. high, straight and slender, scarcely half a line broad on the side, the sharp angles rough above. Sterile leaves thread-like, convolute, the cross section exactly circular. Spike ferruginous, oblong linear, ½-inch long, of 3–4 contiguous, sessile spikelets, the uppermost club-shaped, male at base, the others elliptical, female, few-flowered. Bracts from an ovate hyaline-margined base which encircles the stem, tapering to rough, somewhat spreading awns, that are longer than their spikelets and commonly shorter than the stems. Scales similar to the bracts, with broader margins and shorter awns, covering the perigynia. Perigynia cartilaginous, ferruginous, pale at base, glabrous, ovate, acuminate-beaked, slightly stalked, 1½ line long, ¾ line broad, long fissured on the outer face (the margins of the fissures whitish), convex on the outer face, the margins of the inner face incurved and serrate above; obscurely nerved. Nut chestnut, round-ovate, biconvex, filling the perigynium. Stigma, 2. Style included.

Resembling *C. glareosa*, Wahl., but a much taller plant, with very different bracts, scales and fruit.

CAREX SPICULOSA? Fries. Cæspitosa. Culmo 1½–2½ ped. alto, acutangulo, scabro, basi vaginis aphyllis tecto. Foliis 1–1½ lin. latis, longe attenuatis, marginibus apiceque triangulari scabris, culmo brevioribus; vaginis fibro-reticulatis. Bracteis foliatis, infimo culmum paule superante, sequentibus gradatim brevioribus. Spica 5–6 poll. longa, e spiculis 5–6 approximatis; masculis 1–3, ⅓–2 poll. longis, linearibus; reliquis femineis vel apice masculis, cylindricis basi angustatis laxifloris, 1½–2 poll. longis, 2 lin. latis, exserte pedunculatis arrectis, infima subremote subnutanta. Pedunculis ⅓–1 poll. longis. Squamis triplinerviis, masculis oblanceolatis abrupte acutis; femineis purpureis carina pallida acutis, vel plus minus scabro-aristatis perigyniis longioribus. Perigyniis stramineis 1¼ lin. longis, ½ lin. latis, obovatis, oblongis, vel ovatis, acuminatis rostellatis, rostri ore integro, pauci-nervatis, plano convexis, marginibus superne parce dentatis. Achenium pallide castaneum, obtusum, marginibus indentatum perigynio ½ brevius. Stamina 3. Stigmata 2.

Salt marshes Medford and Arlington, Massachusetts. *C. spiculosa* is a native of the shores of the White Sea, Russia.

Cæspitose. Stem 1½–2½ feet high, sharply angled, scabrous, covered at base with leafless sheaths. Leaves 1–1½ lines broad,

tapering to a long, slender summit, rough on the margins and the triangular apex, shorter than the stem, their sheaths fibrous-netted. Bracts leafy, the lowest a little longer than the stem, the succeeding gradually shorter. Spike 5–6 in. long, of 5–6 approximate spikelets; the male 1–3, $\frac{1}{3}$–2 in. long, linear; the rest female or male at top, cylindrical, narrowed and loosely flowered at base, $1\frac{1}{2}$–2 in. long, 2 lines broad, exsertly peduncled, ascending, or the lowest a little remote and somewhat nodding. Peduncles $\frac{1}{3}$–1 in. long. Scales three-nerved, the male oblanceolate abruptly acute, the female purple, with pale keel, acute or more or less roughly awned, longer than the perigynia. Perigynia straw-colored, $1\frac{1}{4}$ lines long, $\frac{1}{2}$ line broad, obovate, oblong or ovate-acuminate, short-beaked, the orifice of the beak entire, few nerved, plano-convex, sparingly toothed on the upper margins. Nut pale chestnut, obtuse, indented on the margins, half as long as the perigynium. Stamens 3. Stigmas 2.

Carex spiculosa is known only by a short description by Fries in his Summa, and by a fuller but still incomplete one by Andersson in his Cyper. Scand. and by a figure without text in Dr. Boott's Ill. Car. The plant above described has a close resemblance to *C. salina*, Wahl. It differs from it in the fibrous reticulation of the sheaths of the leaves. The lowest spikelet is more distant on a longer peduncle and somewhat nodding. If, upon a more complete knowledge of *C. spiculosa*, the Medford plant shall be proved not to belong to that species, it may perhaps be considered as a hybrid. It grows in company with *C. salina* and *C. maritima*, Murray, and quite near to *C. angustata*, Boott, and *C. vulgaris*, Fries.

CAREX HISPIDA, Willd. (*C. echinata*, Desf. Boott.) Glauca. Rhizomate crasso, lignoso, squamis fuscis imbricatis tecto. Culmo valido, obtusangulo, lævi, basi plurifoliato, 2–6 ped. alto. Foliis 3–6 lin. latis, sursum longe attenuatis, culmo brevioribus, lævibus, carinatis, lateribus recurvatis, marginibus et carina dentatis, basi fuscis complicatis, vaginis antice sæpe reticulato-fissis, fibris coloratis. Bractea infima plerumque culmo longiore evaginata, vel vagina $\frac{1}{2}$–3 poll. longa prædita. Spica 9–18 poll. longa e spiculis 4–10 cylindricis, densifloris, arrectis; masculis 3–6, 1–$3\frac{1}{2}$ poll. longis, gracilibus, contiguis, sessilibus vel breve pedunculatis; inferioribus nunc ternatis; reliquis femineis, vel superioribus supra plus minus masculis, 2–4 poll. longis, 3–4 lin. latis; singulis vel mediis geminatis vel ternatis (una earum omnino vel apice mascula); extremis singulis; inferioribus nunc remotis, raro basi attenuatis, nutantibus, pedunculatis. Pedunculis plerumque

brevibus, subinde 1–13 poll. longis. Squamis membranaceis, purpureis, hyalino-marginatis, trinerviis; masculis oblongis vel obovatis, obtusis vel breviaristatis; femineis lineari-lanceolatis, truncatis vel acutis, plus minus aristatis; arista pallida, lata, marginibus serrata. Perigyniis membranaceis, stramineis vel ferrugineis, circa 2 lin. longis, 1 lin. latis, ovalibus vel obovatis, abrupte cylindrico-rostellatis, rostri ore pertuso, integro vel emarginato dilatato, antice planiusculis, dorso convexo angulatis, paucinervatis, maturitate apice inflatis, divergentibus scabris, marginibus ciliato-dentatis, squamis latioribus longioribus vel (arista) brevioribus. Achenium castaneum, triquetrum, ovoideum vel obovoideum, stylo æquali apicatum, stipitatum, perigynio ½ brevius, et eo laxe inclusum. Stamina 3, et (f. Drejer) 4. Stigmata 3–2.

S. Arizona, *Lemmon*, April, 1880. *Pringle*. *M. E. Jones*, 1882. Littorum maris Mediterranei in Europa et Africa incola.

Glaucous. Rootstock thick, woody, clothed with dark imbricated scales. Stem stout, obtusely angled, smooth, several leaved at base, 2–6 feet high. Leaves 3–6 lines broad, tapering to a long slender summit, shorter than the stem, smooth, keeled, recurved on the sides, toothed on the margins and keel, dark-colored and conduplicate at the base, the inner face of the sheaths often breaking up into colored netted fibres. The lowest bract commonly longer than the stem, not sheathed, or sometimes furnished with a sheath ½–3 inches long. Spike 9–18 inches long, of from 4–10 cylindrical, densely flowered, ascending spikelets; the male 3–6, 1–3½ inches long, slender, contiguous, sessile or short peduncled, the lower sometimes grouped in threes; the rest female, or the upper more or less male above, 2–4 inches long, 3–4 lines broad, single, or the middle ones in pairs or threes (one of them male or male at top), the highest and lowest single; the lower sometimes remote, rarely attenuated at base, nodding, peduncled. Peduncles generally short, sometimes 1–13 inches long. Scales membranous, purple, hyaline-margined, three-nerved; the male oblong or obovate, obtuse or abruptly short-awned; the female linear-lanceolate, truncate or acute, more or less awned; the awn broad, pale, serrate on the margins. Perigynia membranous, straw-colored or ferruginous, about 2 lines long, 1 line broad, oval or obovate, abruptly cylindrically short-beaked; the orifice of the beak open, entire or emarginate, dilated; nearly flat on the inner face, angled, few nerved on the outer, inflated at maturity, and diverging, rough, the margins ciliate-toothed, broader, longer, or, including the awn, shorter than the scales. Nut chestnut, three-

sided, ovoid or obovoid, tipped by the equal style, stalked, loosely inclosed in and half as long as the perigynium. Stamens 3 and (according to Drejer) 4. Stigmas 3–2.

Carex hispida was discovered about a hundred years ago by Desfontaines, on the coast of Barbary, and named by him *C. echinata*. As this name had been previously given, by Ehrhart, to another species since named *C. stellulata* by Goodenough, Willdenow changed it to *C. hispida*, and he has been generally followed by caricologists, with the exception of Dr. Boott. *C. hispida* is a not uncommon plant on the shores of the Mediterranean Sea, and has received different names from different collectors. Drejer, who has discussed the species at length in his Symbolæ, quotes thirteen synonyms. He characterizes it as extremely variable. The perigynium of the Arizona specimens is at first plano-convex, agreeing with the European plant, but at full maturity is inflated at top and divergent. Willdenow's character was taken from immature specimens, as he allows. The only roughness of the perigynia mentioned by him is "capsulis marginatis hispidulis" which exactly describes the Arizona specimens. The affinity of *C. hispida* is, according to Drejer, with *C. glauca*, Scop., *C. trinervis*, Desgl., and *C. setigera*, Don; while Dr. Boott sees a closer resemblance to his *C. laciniata*.

Carex Assiniboinensis, sp. n. Culmo 2–2½ pedes alto, filiformi, debili lævi basi vaginis lineari-lanceolatis, purpureis, laxis, efoliatis, margine sparse reticulato-fissis tecto, fibris capillaribus. Foliis 4–6 poll. longis, 1 lin. latis, margine et apice attenuato-triangulari scabris, culmo brevioribus. Bractea mascula squamæformi aristata spicula breviore, bracteis femineis linearibus, apice longe attenuatis, spiculas suas superantibus, culmo brevioribus, vaginatis. Vagina 1–1½ poll. longa. Squamis membranaceis, pallide ferrugineis, nervo medio angusto viridi, lanceolatis, acuminatis vel aristatis; femineis basi amplectentibus perigyniis aequilatis longioribus vel brevioribus. Spica 7–11 poll. longa e spiculis 3–4 distantibus suprema mascula, lineari-oblanceolata pollicem longa, ceteris femineis anguste cylindricis, ½–1¼ poll. longis alternatum remotiuscule pauci (5–6) floris flexuosis nutantibus, pedunculatis. Pedunculis 1½–3 poll. longis scabriusculis. Perigyniis crustaceis lanceolatis, trigonis, obtusangulis, 3 lin. longis, 1 lin. crassis, basi substipitalis in rostrum longum oblique sectum attenuatis, ore longo integro acuto hyalino; tuberculis acutis dentatis apice setigeris asperatis, infra sordide flavis, supra viridibus, basi grosse nervatis. Achenium ellipsoideum, obtusum, arete inclusum, perigynii dimideo brevius. Stylus elongatus. Stigmata 3.

Assiniboine Rapids, June 14, 1879, *Macoun*. Lake Manitoba, June 9, 1881, *Macoun*.

Stem 2–2½ feet high, filiform, weak, smooth, clothed at the base with loose, linear-lanceolate, purple, leafless sheaths, their margins breaking up into fine, hair like netted fibres. Leaves 4–6 in. long, 1 line broad, rough on the margins, and at the very slender, triangular summit, shorter than the stem. Male bract, scale-like, awned, shorter than its spikelet; female bracts linear, tapering to a very slender point, longer than their spikelets, shorter than the stem, sheathed. Sheaths 1–1½ inches long. Scales membranous, of a pale, rusty color, the midnerve narrow, green, lanceolate, acuminate or awned; the female clasping at base, longer or shorter than, and as broad as the perigynia. Spike 7–11 in. long, of 3–4 distant spikelets, the uppermost male linear oblanceolate 1 in. long; the others, female, narrowly cylindrical, ½–1¼ in. long, alternately, and rather remotely few (5–6) flowered, flexuous, nodding, peduncled. Peduncles 1½–3 in. long, roughish. Perigynia crustaceous, lanceolate, obtusely 3 angled, 3 lines long, 1 line thick, somewhat stalked, tapering to a long, obliquely cut beak, the long, entire sharp orifice hyaline; rough, with sharp, toothed, bristle tipped tubercles, dull yellow below, green above, coarsely nerved at base. Nut ellipsoidal, obtuse, closely invested by the perigynium and not half its length. Style elongated. Stigmas, 3.

Like *C. debilis*, Mx. in habit, but distinguished from it and others of the *debilis* group by the sculpture of the perigynium and its long, entire sharp pointed orifice.

Carex acutata, Boott. Rhizomate repente, stolonifero. Culmo 1½–2 ped. alto, valido, basi foliis amplectentibus clauso. Foliis 3–5 lin. latis, culmo longioribus, planis, carinatis, reticulato-venosis. Bractea infima 6–15 poll. longa, nunc vaginulata; reliquis spiculis duplo triplo longioribus, nisi summa brevis. Spica 1–7 poll. longa, e spiculis 4–6 oblongis vel cylindricis; superioribus vel omnibus aequialtis, contiguis, subsessilibus, vel spicatim dispositis; masculis 1–2 fusco-ferrugineis, subinde abbreviatis, vel 1–2¼ poll. longis, 1–1½ lin. latis; reliquis femineis, vel superioribus apice masculis, densifloris, subsesselibus, vel inferioribus pedunculatis, 8 lin. to 2½ poll. longis, 4 lin. latis. Pedunculus infimus ½–1½ poll. longus. Perigyniis ovalibus rostratis, acute bifidis, ventricosis, modice biconvexis, costato-nervosis, glabris, lucidis, tesselatis, pallide viridibus, $1\frac{9}{10}$ lin. longis $\frac{6}{10}$ lin. latis, squamis purpureis, nervo pallido, ellipticis vel ovalibus, acutis, muticis, ciliatis, vel hispido-aristatis longioribus vel bre-

vioribus. Achenium oblongo-ellipticum, triquetrum, ferrugineum, basi styli contorta vel depresso-curvato apiculatum.—Ill. Car. p. 138.

Arizona, Santa Rita Mts., May 28, 1882, *C. G. Pringle.* Huachuca Canon, June 24, 1882, *J. G. Lemmon.* Previously described as a native of West South America and of Brazil.

Rootstock creeping, stoloniferous. Stem 1½–2 feet high, stout, concealed below by the clasping leaves. Leaves 3–5 lines broad, longer than the stem, flat, keeled, netted-veined. Lowest bract 6–15 in. long, occasionally short sheathed, the rest, with the exception of the short uppermost one, two or three times longer than their spikelets. Spike 1–7 in. long, of 4–6 oblong or cylindrical spikelets; the upper or all of equal height, contiguous, subsessile, or disposed in spikes; male spikelets 1–2, of a dark, rusty color, either short or 1–2¼ in. long, 1–1½ lines broad, the rest female, or the upper male at top, densely flowered, subsessile, or the lower peduncled, 8 lines to 2¼ in. long, 4 lines broad. Lowest peduncle ½–1½ in. long. Perigynia oval, beaked, sharply bifid, ventricose, somewhat biconvex, ribbed, smooth, shining, checkered, pale green, $1\frac{9}{10}$ lines long, $\frac{6}{10}$ line broad, longer or shorter than the purple, pale nerved elliptical or oval, sharp-pointed, ciliate, or hispidly awned scales. Nut oblong elliptical, three-sided, ferruginous, tipped by the contorted or depressed curved base of the style.

Allied to *C. tentaculata* and its allies.

Carex Lemmoni, n. sp. Cæspitosa. Culmis 2 ped. altis, latere ½ lin. latis, obtusangulis lævibus, vaginis omnibus foliiferis, infra medium foliatis. Foliis lineari-lanceolatis, apice subulato triquetris, erectis, vaginatis, 1½ lin. latis, culmeis 3–4, sterilibus 6–10 poll. longis. Bracteis foliatis vaginatis, spiculis longioribus, culmis brevioribus. Vaginis ½–1¼ poll. longis. Ligula oppositifolia obtusa. Squamis pallide-ferrugineis, membranaceis, margine hyalina, oblongo-obovatis, obtusis, mucronatis, perigynia æquantibus. Perigyniis ferrugineis, membranaceis, lævibus, triquetro, oblongis, basi acutis, acuminato rostratis, 1¾ lin. longis, ½–¾ lin. latis, rostro bidentato margine serrato dentato, nervatis. Achenium atro-castaneum, triquetro obovoideum, basi productum apice obtusum stylo æquali apiculatum. Stigmata 3.

J. G. Lemmon, 1875.

Tufted. Stem two feet high, half a line broad on the sides, obtusely angled, smooth, leaved below the middle, all the sheaths leaf bearing. Leaves linear-lanceolate, triangular awl pointed at top, erect, sheathed, 1½ lin. broad; stem leaves 3–4,

the sterile 6–10 in. long. Bracts leafy sheathed, longer than their spikelets, shorter than the stems. Sheaths $\frac{1}{2}$–$1\frac{1}{4}$ inches long. Ligule opposite to the blade, obtuse. Scales pale rusty, membranous, with hyaline margins, oblong-obovate, obtuse, mucronate, equaling the perigynia. Perigynia ferruginous, membranous, smooth, triangular-oblong, acute at base, acuminate-beaked, $1\frac{3}{4}$ lin. long, $\frac{1}{2}$–$\frac{3}{4}$ lin. broad, the beak bidentate, serrate toothed on the margins, nerved. Nut dark chestnut, triangular obovoid, tapering to the base, obtuse at the top, tipped by the equal style. Stigmas, 3.

Allied to *C. distans*, L. Stem and leaves of a tawny yellow color.

In a specimen of *Rhyncospora* (*Ceratoschœnus*) *macrostachya*, Torr., from Arkansas, the perianth consists of short, stout, awl-shaped bristles, thus destroying one of the characters supposed to distinguish it from *R. corniculata*, Gray.

Carex glauca, Scop., was found growing in sterile clayey soil near London, Ont., in June, 1881, by Dr. T. J. W. Burgess, and in a railway cutting near Windsor, Nova Scotia, by Prof. Macoun, in June, 1883.

Carex hirta, L., is occasionally met with near Boston and in ballast heaps at Philadelphia. Both species are probably immigrants from Europe.

Notes on Phoradendron flavescens, Nutt. I.

BY J. SCHNECK.

Although this parasite is common throughout the southern half of our Union, the dates of the different stages in the evolution of its bud to the mature fruit appear to be still imperfectly understood. The following observations are taken from notes made during the past eighteen months, and may help to develop the facts in the case.

Dec. 25, 1882—Fruit abundant and ripe. Mature pistillate flowers on the same plants, but these are always toward the distal extremity from the fruit. Staminate flowers, on separate plants, withered, but the stamens clearly visible, in the more perfect, on pressing back the sepals. *Buds in the axils of the leaves.*

Jan. 15, 1883—Staminate spikes withered and dropping off, but no change in the pistillate.

April 20, 1883—Could find no male spikes, but many plants that have no spikes at all. Pistillate flowers larger and more

prominent on the rachis than at previous observation. Old fruit all gone. *Buds in the axils of the leaves not changed.*

June 26, 1883—Ovaries still larger and more prominent. The *buds in the axils of the leaves* of Dec. 25, 1882, have developed into vigorous young stems, *bearing an abundance of young spikes.*

July 27, 1883—Fruit near the size of white mustard seed. *The new shoots still larger and their spikes further developed* than at last observation.

Sept. 15, 1883—Berries near two-thirds natural size, still green. Calyx on the summit of the ovaries. Staminate and pistillate *flowers, on this season's growth, about to open*; here and there one is open, exposing the full grown anthers. There is a very marked difference in the shape and size of the staminate and pistillate spikes. The former are from 1 to 1½ inches long; rachis bare at several points, so as to give the appearance as if two to four short spikes were joined together; this is still more forcibly impressed by the fact that between each cluster of flowers, in both the staminate and pistillate plants, is found an entire sheath or bract. The pistillate spikes are only three-fourths inch, or less, in length, and are also divided into two to four clusters; but the number of flowers in a cluster is less than in the staminate plants.

Oct. 23, 1883—Berries full grown and nearly ripe. *The flowers that have been since June developing are now in full anthesis.* The older ones are beginning to wither, but the majority are shedding pollen. The color, shape of the leaves and length of the spikes, serve to distinguish the staminate and pistillate plants at sight. In the former the color of the whole plant is a pale green, leaves oblong spatulate, spikes twice the length of those in the pistillate plants. In the latter the color is a deeper green, leaves ovate or obovate. So marked and constant are these differences in the color of the plant and shape of the leaves, that one can, without close inspection, select from a pile of plants either sex at will.

Dec. 6, 1883—Fruit ripe. *The male flowers withering and dropping off, while the pistillate have made little change since October.* From the above observations we may draw the following conclusions: The buds which are found in the axils of the leaves, in late fall and winter, develop into young shoots during the following spring and summer; these bear spikes of flowers which are in anthesis during October and November. The male spikes drop their flowers, and by March have themselves fallen. The

fructified pistillate flowers make very little growth from October to the following spring, at which time the fruit begins to develop, and by November is mature; being near twelve months from the first appearance of the bud until full anthesis, and twelve months more from anthesis to the perfect fruit.

Notes on Eriochloa.

BY GEORGE VASEY.

Kunth founded the genus *Eriochloa* on the specimens of Humboldt's American collection, and in Humboldt's Nov. gen. et sp. vol. 1, p. 94, states that the spikelets are one-flowered. But in his *Enumeratio Plantarum*, vol. 1, p. 71, published many years afterwards, describing the genus, he says the spikelets are two-flowered, the upper flower hermaphrodite with two palets; the lower flower neuter with one palet similar to the glumes, or *rarely male* with two palets. The term palets he applies to both envelopes of the flower, now called flowering glume and palet, and in the statement of the lower flower neuter with one palet, he considers one of the outer glumes as a palet, or as belonging to a flower of which the other parts are suppressed. The change in Kunth's description was probably made so as to include the *Panicum molle* of Michaux. An examination of our specimens, as distributed by Mr. Curtiss, show two-flowered spikelets, the usual perfect flower, and a male one with three stamens and a thin, membranaceous two-nerved palet. In Kunth's description this character is referred to in his expression "varius bipaleaceo, masculo."

Mr. Bentham in the *Flora Australiensis* describing *Eriochloa* says, spikelets one flowered. Benth. and Hook., in *Genera Plantarum* say the same. The question arises as to where did Mr. Bentham refer our *Eriochloa mollis*, the *Panicum molle* of Michx. He does not refer to it by name, and has either ignored it or has referred it to *Panicum*. But it does not fit in any of the sections of *Panicum*, and is in all respects a good *Eriochloa* with a second flower, and the character of the genus should be altered to admit it.

The *Eriochloa annulata* No. 3,600* of Curtiss's distribution agrees with the *E. mollis* in having two-flowered spikelets. When I first received it from Mr. Curtiss I was inclined to call it a

variety of *E. mollis*, but Mr. Curtiss said there was a great dissimilarity of appearance, and I, hesitatingly, and improperly referred it to *E. annulata*, specimens of which we have from the W. Indies. The spikelets of our plant are nearly twice as large as those of the W. Indian plant, and have two flowers, while that has one. The general appearance of *E. mollis* and *E. annulata?* of Curtiss's distribution is quite dissimilar, but the flowers can hardly be distinguished, and a specimen from Florida collected by Dr. Garber seems almost to connect the two.

In my published list of grasses I made *E. mollis* a variety of *E. punctata*. This, I suppose, must be changed, for our Texas specimens of *E. punctata* have smaller, one flowered spikelets, with much more pointed glumes. Therefore *E. mollis* must be restored as a species. As to our *E. annulata?* it must either become a species, or be considered a variety of *E. mollis*. They need to be further observed, perhaps, before this point can be clearly determined. Our species of *Eriochloa* then will need to be divided into two sections, one with one flower, the other with two flowers, and will stand as follows:

§ 1. Spikelets one-flowered.

1. *E. sericea*, Munro; 2. *E. punctata*, Hamilton; 3. *E. grandiflora* (Helopus grandiflorus, Trin.)

§ 2. Spikelets two-flowered.

4. *E. mollis*, Kunth; and var. *longifolia* or a new species.

GENERAL NOTES.

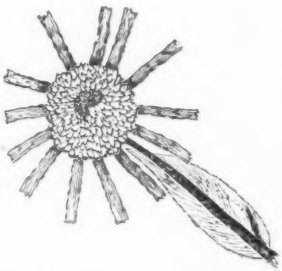
Erythræa.—Professor Wittrock, of Stockholm, is publishing *Exsiccatæ* of the genus *Erythræa*. He wishes to include the North American species and forms, and no less the European species as naturalized in the United States. I am to ask American botanists, who can do so, to prepare for this work a set of a hundred or two hundred specimens (enough for thirty-five copious sets), of any species within their reach. For compensation, by exchange or otherwise, they should correspond with Dr. N. Wittrock, Royal Academy of Sciences, Stockholm, Sweden.—A. GRAY.

Notes on Economic Botany.—*Asclepias Crux-Andreæ*, L.—The crushed leaves, and especially the half ripe pods of "St. Andrew's Cross," are used quite extensively by the country people for checking bleeding at the nostrils. The parts used are crushed in the hand and the aromatic emanations inhaled, which seem sufficiently astringent to contract the capillaries and check the flow of blood.

Cotton Seed.—Before the manufacture of cotton-seed oil became so great an industry in the Southern States, the seeds of the cotton plant were largely a waste product. Cattle were fed on the fresh seeds, to some extent, and sus-

tained no injury, but swine were killed by them. It was the custom among some planters to throw the seed into the water during the rainy season, in such situations as became dry during the summer. Maceration for several months placed the seed in a condition to be used by swine as food, and during the dry season the seeds were eaten by them greedily without injury.—F. L. HARVEY, *Fayetteville, Ark.*

Rudbeckia hirta, L.—I collected July 28, 1882, in Shelburne, N. H., a specimen of *Rudbeckia hirta*, in which the tubular disk flowers were all changed to ligulate flowers, nearly twice their ordinary length. The ray flowers were as usual. The accompanying sketch illustrates the flower.—WALTER DEANE, *Cambridge, Mass.*



Variation and Human Interference.—DEAR EDITOR—I have this spring received from one source wild specimens of *Thalictrum anemonoides*, with full double flowers; from another, *Epigæa*, in the same condition. As these variations can not well be regarded as advantageous to the plants themselves, will you report the case to Dr. Sturtevant, who has made an acute suggestion about such things, and ask him if we are to infer that the aborigines of Maryland and New Hampshire were in former times floriculturists?—A. G.

What a Lilac Bush did.—Two cut stones forming a part of a corner foundation of Dr. Gray's residence at Cambridge have been misplaced by a lilac bush which some years since insinuated itself into a very close joint in the stone-work. The lower stone which has been misplaced is three feet long, about a foot high, and eight inches deep. Upon this rests a stone of similar shape, two feet long. These stones form one end of the wall. In the joint between the lower stone and the main body of the wall the lilac sprout established itself. The bush, now scarcely more than an inch in diameter, has forced the lower stone an inch away from the remaining wall in a horizontal direction. Moreover, the upper stone, being attached to the lower by mortar and being held down by the weight of the building, has shared equally in the displacement.—L. H. BAILEY, JR.

EDITORIAL NOTES.

POLYEMBRYONY, arising probably from the formation of more than one germ cell in the embryo sac, has been noticed in *Trifolium pratense*.

MAXIME CORNU, the distinguished botanist, has recently been appointed *Professeur de culture* to the Jardin des Plantes at Paris, as successor to the late M. Decaisne.

A STRONG popular interest is manifested in England in the scientific results of the study of the diseases of cultivated plants.

PROF. W. W. BAILEY, of Brown University, reports finding a raceme of *Cytisus Canariensis*, a common hot-house plant, terminated by a well-marked leafy branch.

IN MR. L. H. BAILEY'S supplement to his catalogue of N. Am. Carices several additions and emendations are made, making the whole number of species catalogued 200, varieties 85.

"THE BOTANISTS of this country need arousing, they are far behind their zoological brethren," says a cotemporary. This is lamentably true, but not to the extent that the page devoted to the subject in *Science Record* would lead one to believe.

THE NOTABLE botanists from across the Atlantic who may be quite confidently expected to attend the American Association at Philadelphia are, so far as now known, Sir Joseph Hooker, Prof. W. R. McNab, Mr. John Ball and Sir J. Lubbock.

THE PREPARATIONS for the entertainment of botanists at the Philadelphia meeting are steadily progressing. Among the special excursions decided upon is one to the Bartram house and garden at Kinsessing, and another to the pine barrens of New Jersey.

PULVERIZED PLANTS dissolved in distilled water have been used recently in some experiments in plant physiology. It is suggested that the solution will probably prove useful in many cases where it is desired to determine the amount and quality of plant food.

WARMING OPPOSES LUDWIG'S THEORY that *Philodendron bipinnatifidum* is fertilized by snails (BOT. GAZ. viii, 230), and considers that it is effected by "small black bees." During the flowering of this Aroid a rise of temperature to the extent of 18.5° C. takes place.

BY STUDYING THEIR DEVELOPMENT, Urban has concluded that the axillary spines of the *Aurantiaceæ* are the metamorphosed lowermost leaves of a theoretical axillary shoot. This explanation is confirmed by finding intermediate forms in some species of *Citrus*.

REV. FRANCIS WOLLE'S new work on the *Desmids of the United States* will contain fifty-three colored plates, and descriptions of nearly five hundred species. It is published at the very low price of five dollars; subscriptions should be sent to the author at Bethlehem, Pa.

THE COLORS of the various parts of plants is not always due to the presence of pigments in the cell-sap. The dark violet-blue of the roots of *Pontederia cordata* is owing to the color of the cell-wall itself. The pigment of the bright red roots of *Wachendorfia thyrsiflora*, though diffused in the cell-sap, is formed even in absolute darkness. The bright red of the fruit of *Rivina humilis* and the bracts of *Euphorbia fulgens* is produced by the superposition of cells having different pigments.

L. W. RUSSELL records in Random Notes a specimen of *Sassafras officinale* having the following dimensions: Circumference at the ground, 14 ft., 3 in.; 2 ft. up, 11 ft., 10.5 in., holding its size with little diminution to the first limbs, 11 ft. up. The height of the tree computed from its shadow was 49.5 ft.

BUSGEN HAS REPEATED Darwin's experiments made some years ago on *Drosera rotundifolia*, and has obtained even more decisive results. From three to five times as many pods were produced on those plants whose leaves were fed with insects as on those unfed, though the latter had an abundance of nutriment about the roots.

PROFS. COULTER AND BARNES are engaged in a special study of the North American species of the genus *Cyperus*. Any specimens that they can beg, borrow or buy will be thankfully received. Loaned specimens will be retained for as short a time as possible and carefully returned. Any assistance rendered will be fully acknowledged.

THERE HAS BEEN a sharp conflict in England between theory and practice, in regard to the question whether the spores of *Peronospora infestans* can filter through five inches of soil and infect uninjured potatoes with the rot, or not. We sincerely hope that the puerile and undignified tone of the controversy will not be adopted by botanists on this side of the Atlantic.

THE RESULT of experiments with 21,000 specimens of *Mercurialis annua* and 6,000 of *Cannabis sativa* show that external influences have little or no influence on the production of seedlings of one or the other sex in these dioecious species. In the former species the number of male flowers was greater and in the second species less than the number of female flowers. Similar experiments with monoecious plants gave similar results.

A CAREFUL STUDY of the differences between the aerial and subterranean parts of the same stems has revealed the fact that the differences are to be attributed to environment rather than to hereditary tendencies. The chief differences are in the greater development of the protecting tissues; the reduction or disappearance of collenchyma, liber-fibers, etc.; great development of cortex and reduction of pith, and feeble lignification.

CYPERACEÆ, Pollen Grains, and Vegetable Monstrosities are botanical subjects lately presented before societies; the first by the Rev. E. J. Hill, with herbarium and microscope illustrations, before the State Mic. Soc. of Ill., the second by Mr. Joseph F. James, with lantern illustrations, before the Cincinnati Soc. of Nat. Hist., and the last by Dr. G. L. Goodale, with illustrations from the Cambridge Botanic Garden, before the Boston Soc. of Nat. Hist.

"THE MILK IN THE COCOANUT" is the title of a racy paper by Grant Allen, reprinted in the May *Popular Science Monthly* from *Cornhill Magazine*. In a charming popular way he explains not only the existence of the milk, but also the significance of the three scars and the triangular shape of the fruit. The latter he supposes indicative of liliaceous ancestry, which may be true and may be not. Like all his deductions, however, it is well worth reading.